LISTING OF CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) Apparatus for producing a marking ~~for example digits, letters, surface patterns, surface images or decoration,~~ on a substrate, wherein the marking produces a particular optical effect by having a diffractively or holographically acting surface structuring or a matt surface structuring which scatters incident light diffusely or directedly ~~preferably a film, in particular a transfer film~~, comprising:

a replication apparatus having a replication surface which is structured with a surface relief, wherein the surface relief is in the form of a negative for the surface structuring of the marking;

a device for producing radiation, preferably a laser installation, which co-operates with the replication apparatus, by the radiation being directed onto at least one irradiation region of the replication apparatus for producing regions of different temperatures on the replication surface forming at least one shaping region defining the marking; and

a counterpressure apparatus,

wherein the ~~a~~ substrate is arrangeable ~~arranged~~ between the replication apparatus and the counterpressure apparatus in order to shape the shaping region onto the substrate in a contact region where ~~between~~ the replication surface contacts ~~apparatus and~~ the substrate, producing the surface structuring ~~shaping structures~~, and

wherein the feed of the radiation for producing the shaping regions extends outside the substrate, ~~wherein the replication surface is structured with a surface relief which is in the form of a negative for shaping structures producing a particular optical effect and that the shaping structures are in the form of diffractively or holographically acting surface structurings or matt structures for diffusely or directedly scattering incident light,~~ and

wherein a position of an impingement point of the radiation on the replication surface is controllable by a one-dimensional or multi-dimensional movement of the radiation and/or that the power density in relation to surface area of the radiation at the impingement point of the radiation on the replication surface is controllable, and

wherein a control sequence for actuation of the radiation-producing device is

extendable over more than one operating cycle of the replication apparatus and

wherein a change in the selection of the shaped region is effectable by a change in the temperature distribution on the replication surface.

2. (Previously Presented) Apparatus as set forth in claim 1, wherein the Poynting vector of the radiation upon impingement on the replication apparatus does not point onto the contact region and/or that the Poynting vector of the radiation upon impingement onto the replication apparatus points onto the contact region but the radiation does not reach the substrate in the contact region.

3. (Previously Presented) Apparatus as set forth in claim 1, wherein there is provided an additional energy source which is preferably separate from the radiation-producing device.

4. (Previously Presented) Apparatus as set forth in claim 3, wherein the additional energy source is such that the temperature of the replication apparatus is adjustable at least in partial regions of the replication surface by means of the additional energy source.

5. (Previously Presented) Apparatus as set forth in claim 3, wherein the additional energy source is formed by a heating laser device and/or an inductive heating device and/or a resistance heating device and/or a device for producing heat beams.

6. (Previously Presented) Apparatus as set forth in claim 1, wherein the replication apparatus is a stamping punch or a stamping cylinder, in particular a rotating roller.

7. (Previously Presented) Apparatus as set forth in claim 6, wherein the rotating roller is of a length of between 500 mm and 2,500 mm and/or its periphery is between 500 mm and 1,500 mm.

8. (Previously Presented) Apparatus as set forth in claim 1, wherein there is provided a control device for controlling the irradiation regions, in particular a freely

programmable control device, wherein it is preferably provided that the control device is adapted for actuating the radiation-producing device.

9. (Previously Presented) Apparatus as set forth in claim 1, wherein there is provided a cooling apparatus for cooling the replication surface, in particular partial regions of the replication surface, which is preferably in the form of a blower, gas flow cooling or a cooling roller.

10. (Previously Presented) Apparatus as set forth in claim 3, wherein the additional energy source is arranged within the replication apparatus.

11. (Previously Presented) Apparatus as set forth in claim 1, wherein the radiation is directed onto the replication surface of the replication apparatus so that it impinges on the replication surface.

12. (Previously Presented) Apparatus as set forth in claim 1, wherein the radiation is arranged parallel to the substrate and/or perpendicularly to the irradiation region of the replication apparatus.

13. (Previously Presented) Apparatus as set forth in claim 1, wherein the replication apparatus has an inside surface which is parallel to and/or concentric with the replication surface and the radiation is directed onto the inside surface so that the radiation impinges on the inside surface.

14. (Previously Presented) Apparatus as set forth in claim 13, wherein, arranged between the inside surface and the replication surface is or are a metal film, in particular a film of nickel or a nickel compound, and/or an absorption layer and/or a heat-conducting layer and/or a transparent layer, in particular a plate or a cylinder which are transparent in relation to the wavelength of the radiation.

15. (Currently Amended) A process for producing a marking on a substrate, wherein the marking produces a particular optical effect by having a diffractively or

holographically acting surface structuring or a matt surface structuring for diffusely or directedly scattering incident light ~~preferably a film, in particular a transfer film~~,

wherein energy in the form of radiation, preferably laser radiation, from a device producing radiation is used for producing regions of different temperatures on ~~at least one shaping region on~~ a replication surface of a replication apparatus forming at least one shaping region defining the marking, and

wherein the replication surface is structured with a surface relief, wherein the surface relief is in the form of a negative for the surface structuring of the marking, and

wherein the surface relief ~~shaping region~~ of the replication surface is shaped onto the substrate, forming the surface structuring ~~shaping structures~~, by the replication apparatus contacting the substrate under pressure, and

wherein the radiation for producing the shaping regions is fed outside the substrate, and

~~wherein the replication surface is structured with a surface relief which is in the form of a negative for shaping structures producing a particular optical effect and that the shaping structures are in the form of diffractively or holographically acting surface structurings or matt structures for diffusely or directedly scattering incident light, and~~

wherein a position of an impingement point of the radiation on the replication surface is controllable by a one-dimensional or multi-dimensional movement of the radiation and/or that the power density in relation to surface area of the radiation at the impingement point of the radiation on the replication surface is controllable, and

wherein a control sequence for actuation of the radiation-producing device extends over more than one operating cycle of the replication apparatus, and

wherein a change in the selection of the shaped region is effected by a change in the temperature distribution on the replication surface.

16. (Previously Presented) A process as set forth in claim 15, wherein the replication apparatus is subjected to a temperature control effect at least in partial regions of the replication surface using an additional energy source which is preferably separate from the radiation-producing device.

17. (Previously Presented) A process as set forth in claim 16, wherein at least one heat combination region is formed on the replication surface by an energy input from the additional energy source and an energy input from the radiation-producing device.

18. (Previously Presented) A process as set forth in claim 16, wherein the shaping region is shaped, which corresponds to the heat combination region or which is complementary to the heat combination region.

19. (Previously Presented) A process as set forth in claim 16, wherein the temperature of the replication surface, which prevails during the shaping operation, is set to a plastic temperature range in at least one region outside the heat combination region by the temperature control effect operation, and that the temperature of the replication surface, which prevails during the shaping operation, is set to a flow temperature range in at least one region within the heat combination regions by the energy additionally introduced with the radiation.

20. (Previously Presented) A process as set forth in claim 16, wherein the temperature of the replication surface, which prevails during the shaping operation, is set to an elastic temperature range in at least one region outside the heat combination region by the temperature control effect operation, and that the temperature of the replication surface, which prevails during the shaping operation, is set to a plastic temperature range in the region within the heat combination regions by the energy additionally introduced with the radiation.

21. (Previously Presented) A process as set forth in claim 19, wherein a range within +/-2% of a substrate-specific plastic temperature is used as the plastic temperature range.

22. (Previously Presented) A process as set forth in claim 19, wherein the range of 180°C +/- 2.5°C is used as the plastic temperature range.

23. (Previously Presented) A process as set forth in claim 15, wherein the replication surface is subjected to a homogenous temperature control effect completely or in surface portions prior to the energy input from the radiation-producing device.

24. (Previously Presented) A process as set forth in claim 15, wherein the temperature of the replication surface is set to at least 100°C, preferably at least 170°C.

25. (Previously Presented) A process as set forth in claim 15, wherein the temperature control of the replication surface is effected by electrical heating and/or by pre-heating radiation, in particular a pre-heating laser beam.

26. (Previously Presented) A process as set forth in claim 15, wherein the replication surface is cooled completely in partial regions after the shaping operation and/or prior to a following energy input from the radiation-producing device.

27. (Previously Presented) A process as set forth in claim 15, wherein the radiation is directed onto the replication surface of the replication apparatus and/or that the radiation is introduced onto a surface remote from the replication surface.

28. (Previously Presented) A process as set forth in claim 15, wherein the radiation is introduced into the replication apparatus before and/or while the heat combination region resulting therefrom is in contact with the substrate.

29. (Previously Presented) A process as set forth in claim 15, wherein a replication roller is used as replication apparatus and that the introduction of radiation into the replication roller is effected at a first angular position of the replication roller and the contact of the replication roller with the substrate is effected at a second angular position of the replication roller, wherein an intermediate angle which is different from 0°, preferably less than 180°, in particular less than 90°, is set between the first angular position and the second angular position in the direction of rotation of the replication roller.

30. (Previously Presented) A process as set forth in claim 15, wherein the radiation acts on the replication apparatus over an area and/or in point form sequentially.

31. (Canceled)

32. (Previously Presented) A process as set forth in claim 15, wherein the radiation-producing device has a plurality of laser sources which are preferably spaced from each other and which in particular are in the form of a diode laser array and in particular are individually actuatable.

33. (Previously Presented) A process as set forth in claim 15, wherein the control sequence extends over more than a revolution of the replication roller or a stroke of the stamping punch.

34. (Previously Presented) A process as set forth in claim 15, wherein the energy input from the radiation-producing device is introduced in the heat combination region by direct absorption and/or heat conduction.

35. (Previously Presented) A process as set forth in claim 15, wherein an apparatus as set forth in claim 1 is used.

36. (Previously Presented) A process as set forth in claim 20, wherein a range within +/-2% of a substrate-specific plastic temperature is used as the plastic temperature range.

37. (Previously Presented) A process as set forth in claim 20, wherein the range of 180°C +/- 2.5°C is used as the plastic temperature range.

38. (Previously Presented) Apparatus as set forth in claim 1, wherein the radiation producing device has a plurality of laser sources which are spaced from each other and which are in the form of a diode laser array and are individually actuatable.

39. (New) A method for forming a light scattering marking on a substrate comprising the steps of:

irradiating a region of a replication surface with laser energy, whereby said irradiated region has a temperature greater than a non-irradiated region of said replication surface, at least one of said irradiated region and said non-irradiated region having a stamping structure;

pressing said replication surface on the substrate whereby said stamping structure thermally deforms the substrate to form the light scattering marking, wherein the marking has boundaries defined by said irradiated and non-irradiated regions of said replication surface.